CONTENTS OF VOLUME 18 · 1994

# Biology and Fertility of Soils

**Editor-in-Chief**

J. C. G. Ottow
Institut für Angewandte
Mikrobiologie
Justus Liebig Universität Giessen
Senckenbergstrasse 3
D-35390 Giessen, Germany

**Co-Editors**

D. C. Coleman
Ecology/Biosciences Office
711 Biological Sciences Building
University of Georgia
Athens, GA 30602-2602, USA

K. Vlassak
Katholieke Universiteit Leuven
Laboratorium voor
Bodemvruchtbaarheid
en Bodembiologie
Kardinaal Mercierlaan 92
B-3001 Leuven, Belgium

**Editorial Board**

R. Aldag, Speyer
M. Allen, San Diego, CA
J. Anderson, Exeter
J. M. Blair, Manhattan, KS
R. G. Burns, Canterbury
H. G. Diem, Nogent-sur-Marne
J. Döbereiner, Rio de Janeiro
W. Foissner, Salzburg
S. I. Ghabbour, Giza (Cairo)
P. M. Groffman, Millbrook, NY
W. Horst, Hannover
K. Inubushi, Chiba
E. Kandeler, Vienna
M. Kimura, Nagoya
R. Knowles, Ste. Anne de Bellevue
J. K. Ladha, Manila
K. E. Lee, Glen Osmond, South Australia
C. Leyval, Vandoeuvre-les-Nancy
J. M. Lynch, Guildford
H. Mai, Tharandt
K. Mengel, Giessen
P. Nannipieri, Florence
H.-R. Schulten, Wiesbaden
N. Sethunathan, Cuttack
D. M. Sylvia, Gainesville
G. Trolldenier, Laatzen
J. A. van Veen, Wageningen
I. Watanabe, Tsu, Mie
W. G. Whitford, Las Vegas, NV
G. W. Yeates, Palmerston North, New Zealand

Springer International

# Biology and Fertility of Soils

Founded in 1985
by J. C. G. Ottow

**Copyright**

Submission of a manuscript implies: that the work described has not been published before (except in the form of an abstract or as part of a published lecture, review, or thesis); that it is not under consideration for publication elsewhere; that its publication has been approved by all coauthors, if any, as well as by the responsible authorities at the institute where the work has been carried out; that, if and when the manuscript is accepted for publication, the authors agree to automatic transfer of the copyright to the publisher; and that the manuscript will not be published elsewhere in any language without the consent of the copyright holders.

All articles published in this journal are protected by copyright, which covers the exclusive rights to reproduce and distribute the article (e.g., as offprints), as well as all translation rights. No material published in this journal may be reproduced photographically or stored on microfilm, in electronic data bases, video disks, etc., without first obtaining written permission from the publisher.

The use of general descriptive names, trade names, trademarks, etc., in this publication, even if not specifically identified, does not imply that these names are not protected by the relevant laws and regulations.

*While the advice and information in this journal is believed to be true and accurate at the date of its going to press, neither the authors, the editors, nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.*

*Special regulations for photocopies in the USA*

Photocopies may be made for personal or in-house use beyond the limitations stipulated under Section 107 or 108 of U.S. Copyright Law, provided a fee is paid. All fees should be paid to the Copyright Clearance Center, Inc., 21 Congress Street, Salem, MA 01970, USA, stating the ISSN 0340-0727, the volume, and the first and last page numbers of each article copied. The copyright owner's consent does not include copying for general distribution, promotion, new works, or resale. In these cases, specific written permission must first be obtained from the publisher.

The Canada Institute for Scientific and Technical Information (CISTI) provides a comprehensive, world-wide document delivery service for all Springer-Verlag journals. For more information, or to place an order for a copyright-cleared Springer-Verlag document, please contact Client Assistant, Document Delivery, Canada Institute for Scientific and Technical Information, Ottawa K1A 0S2, Canada (Tel: 6 13-9 93-92 51; Fax: 6 13-9 52-82 43; e-mail: cisti.docdel@nrc.ca).

**Composition**

K + V Fotosatz, Beerfelden

**Printers**

Graphischer Betrieb Konrad Triltsch, Würzburg

© Springer-Verlag Berlin Heidelberg 1994

Springer-Verlag GmbH & Co KG,
D-14197 Berlin, Germany

Printed in Germany

Springer International

# Contents of Volume 18 · 1994


Abd-Alla MH: Use of organic phosphorus by *Rhizobium leguminosarum* biovar *viceae* phosphatases 216
Adhya TK, Rath AK, Gupta PK, Rao VR, Das SN, Parida KM, Parashar DC, Sethunathan N: Methane emission from flooded rice fields under irrigated conditions 245
Ahmad MH, Morgan V: Characterization of a cowpea (*Vigna unguiculata*) rhizobiophage and its effect on cowpea nodulation and growth 297
Ahmad MH → Daniels-Hylton KDM
Ajwa HA, Tabatabai MA: Decomposition of different organic materials in soils 175
Akinnifesi FK → Kang BT
Albaladejo J → Roldán A
Allen MF → Morris SJ
Angers DA → Simard RR
Antisari LV → Marzadori C
Azam F, Simmons FW, Mulvaney RL: Effect of ammonium fixation and displacement on the added nitrogen interaction in incubation experiments 99
Azam F, Simmons FW, Mulvaney RL: The effect of inorganic nitrogen on the added nitrogen interaction of soils in incubation experiments 103
Azcón R → Cuenca G

Badalucco L, Pomaré F, Grego S, Landi L, Nannipieri P: Activity and degradation of streptomycin and cycloheximide in soil 334
Bagyaraj DJ → Harinikumar KM
Bansal M, Mukerji KG: Efficacy of root litter as a biofertiliser 228
Bardgett RD, Speir TW, Ross DJ, Yeates GW, Kettles HA: Impact of pasture contamination by copper, chromium, and arsenic timber preservative on soil microbial properties and nematodes 71
Baskaran S → Bolan NS
Beauchamp EG → Bergstrom DW
Beese F → Brunninger B
Bello A → Nombela G
Benckiser G → Schwarz J
Bergstrom DW, Tenuta M, Beauchamp EG: Increase in nitrous oxide production in soil induced by ammonium and organic carbon 1
Bolan NS, Naidu R, Mahimairaja S, Baskaran S: Influence of low-molecular-weight organic acids on the solubilization of phosphates 311
Brunninger B, Viswanathan R, Beese F: Terbuthylazine and carbofuran effects on growth and reproduction within three generations of *Eisenia andrei* (Oligochaeta) 83
Bull CM → Hughes MS
Burns RG → Rogers SL

Callaghan T → Moorhead DL
Codling EE → Siddaramappa R
Conrad R → Häring V
Cuenca G, Azcón R: Effects on ammonium and nitrate on the growth of vesicular-arbuscular mycorrhizal *Erythrina poeppigiana* O.I. Cook seedlings 249

Daniels-Hylton KDM, Ahmad MH: Inoculation response in kidney beans (*Phaseolus vulgaris*, L.) to vesicular-arbuscular mycorrhizal fungi and rhizobia in non-sterilized soil 95
Danso SKA → Kumaga F
Das AC, Mukherjee D: Effect of insecticides on the availability of nutrients, nitrogen fixation, and phosphate solubility in the rhizosphere soil of rice 37
Das SN → Adhya TK
Davoren CW → Doube BM
Davoren CW → Stephens PM
Donelly PK → Entry JA
Doube BM, Ryder MH, Davoren CW, Stephens PM: Enhanced root nodulation of subterranean clover (*Trifolium subterraneum*) by *Rhizobium leguminosarium* biovar *trifolii* in the presence of the earthworm *Aporrectodea trapezoides* (Lumbricidae) 169
Doube BM → Hughes MS
Doube BM → Stephens PM
Duyts H → Kester RA

Eder G → Kandeler E
Edwards AC → Pant HK
Emmingham WH → Entry JA
Entry JA, Donelly PK, Emmingham WH: Microbial mineralization of atrazine and 2,4-dichlorophenoxyacetic acid in riparian pasture and forest soils 89

Fischer WR → Friedel JK
Friedel JK, Mölter K, Fischer WR: Comparison and improvement of methods for determining soil dehydrogenase activity by using triphenyltetrazolium chloride and iodonitrotetrazolium chloride 291
Fritze H, Järvinen P, Hiukka R: Near-infrared characteristics of forest humus are correlated with soil respiration and microbial biomass in burnt soil 80

Gioacchini P → Marzadori C
Gordon R, Schuepp P: Water-manure interactions on ammonia volatilization 237
Grant IF → Simpson IC
Grego S → Badalucco L
Gupta PK → Adhya TK

Häring V, Klüber HD, Conrad R: Localization of atmospheric $H_2$-oxidizing soil hydrogenases in different particle fractions of soil 109

Harinikumar KM, Bagyaraj DJ: Potential of earthworms, ants, millipedes, and termites for dissemination of vesicular-arbuscular mycorrhizal fungi in soil 115
Hartmann A → Lebuhn M
Hayano K → Watanabe K
Heilmann B → Lebuhn M
Hermans MCC → Yeates GW
Hindell RP, McKenzie BM, Tisdall JM, Silvapulle MJ: Relationships between casts of geophagous earthworms (*Lumbricidae, Oligochaeta*) and matric potential. I. Cast production, water content, and bulk density 119
Hindell RP, McKenzie BM, Tisdall JM, Silvaulle MJ: Relationships between casts of geophagous earthworms (*Lumbricidae, Oligochaeta*) and matric potential. II. Clay Dispersion from casts 127
Hiukka R → Fritze H
Hughes MS, Bull CM, Doube BM: The use of resource patches by earthworms 241
Hunt JL → Yeates GW

Järvinen P → Fritze H

Kandeler E, Eder G, Sobotik M: Microbial biomass, N mineralization, and the activities of various enzymes in relation to nitrate leaching and root distribution in a slurry-amended grassland 7
Kang BT, Akinnifesi FK, Pleysier JL: Effect of agroforestry woody species on earthworm activity and physicochemical properties of worm casts 193
Kapp M → Schwarz J
Kester RA, Wijlhuizen AG, Duyts H, Laanbroek HJ: Chemiluminescence analysis of nitric oxide in small-volume samples by a modified injection method 260
Kettles HA → Bardgett RD
Khanuja SPS, Suman A, Singh G, Kumar V: Nodule-specific expression of *Rhizobium meliloti* symbiotic promoters P1 and P2 in chickpea-*Rhizobium* sp. symbiosis 132
Kieft TL: Grazing and plant-canopy effects on semiarid soil microbial biomass and respiration 155
Kimura M → Toyota K
Klemedtsson LK, Mosier AR: Effect of long-term field exposure of soil to acetylene on nitrification, denitrification, and acetylene consumption 42
Klüber HD → Häring V
Kolbe D → Schroth G
Kumaga F, Danso SKA, Zapata F: Time-course of nitrogen fixation in two bambara groundnut (*Vigna subterranea* L. Verdc.) cultivars 231
Kumar V → Khanuja SPS

Kutsch H, Schumacher B: Isoelectric focusing of humic substances on ultrathin polyacrylamide gels: evidence of fingerprint performance 163

Laanbroek HJ → Kester RA
Landi L → Badalucco L
Lapierre C → Simard RR
Lebuhn M, Heilmann B, Hartmann A: Effects of drying/rewetting stress on microbial auxin production and L-tryptophan catabolism in soils 302

Mahimairaja S → Bolan NS
Margesin R, Schinner F: Phosphomonoesterase, phosphodiesterase, phosphotriesterase, and inorganic pyrophosphatase activities in forest soils in an alpine area: effect of pH on enzyme activity and extractability 320
Marzadori C, Antisari LV, Gioacchini P, Sequi P: Turnover of interlayer ammonium in soil cropped with sugar beet 27
McCarty GO → Siddaramappa R
McKenzie BM → Hindell RP
Mölter K → Friedel JK
Moorhead DL, Callaghan T: Effects of increasing ultraviolet B radiation on decomposition and soil organic matter dynamics: a synthesis and modelling study 19
Morgan V → Ahmad MH
Morris SJ, Allen MF: Oxalate-metabolizing microorganisms in sagebrush steppe soil 255
Mosier AR → Klemedtsson LK
Mukerji KG → Bansal M
Mukherjee D → Das AC
Mulvaney RL → Azam F

Naidu R → Bolan NS
Nannipieri P → Badalucco L
Navas A → Nombela G
Nombela G, Navas A, Bello A: Structure of the nematofauna in Spanish Mediterranean continental soils 183

Oficial R → Simpson IC
Orchard VA → Yeates GW
Osonubi O: Comparative effects of vesicular-arbuscular mycorrhizal inoculation and phosphorus fertilization on growth and phosphorus uptake of maize (*Zea mays* L.) and sorghum (*Sorghum bicolor* L.) plants under drought-stressed conditions 55
Ottow JCG → Schwarz J

Pant HK, Vaughan D, Edwards AC: Molecular size distribution and enzymatic degradation of organic phosphorus in root exudates of spring barley 285
Parashar DC → Adhya TK
Parida KM → Adhya TK
Pleysier JL → Kang BT
Pomaré F → Badalucco L

Raghubanshi AS: Effect of bamboo harvest on dynamics of nutrient pools, N mineralization, and microbial biomass in soil 137
Rao VR → Adhya TK
Rath AK → Adhya TK
Roger PA → Simpson IC
Rogers SL, Burns RG: Changes in aggregate stability, nutrient status, indigenous microbial populations, and seedling emergence, following inoculation of soil with *Nostoc muscorum* 209
Roldán A, Albaladejo J: Effect of mycorrhizal inoculation and soil restoration on the growth of *Pinus halepensis* seedlings in a semiarid soil 143
Ross DJ → Bardgett RD
Ryder MH → Doube BM
Ryder MH → Stephens PM

Schinner F → Margesin R
Schroth G, Kolbe D: A method of processing soil core samples for root studies by subsampling 60
Schuepp P → Gordon R
Schumacher B → Kutsch H
Schwarz J, Kapp M, Benckiser G, Ottow JCG: Evaluation of denitrification losses by the acetylene inhibition technique in a permanent ryegrass field (*Lolium perenne* L.) fertilized with animal slurry or ammonium nitrate 327
Sequi P → Marzadori C
Sethunathan N → Adhya TK
Siddaramappa R, McCarty GW, Wright RJ, Codling EE: Mineralization and volatile loss of nitrogen from soils treated with coal combustion byproducts 279
Siepel H: Life-history tactics of soil microarthropods 263
Silvapulle MJ → Hindell RP
Simard RR, Angers DA, Lapierre C: Soil organic matter quality as influenced by tillage, lime, and phosphorus 13
Simmons FW → Azam F

Simpson IC, Roger PA, Oficial R, Grant IF: Effects of nitrogen fertiliser and pesticide management on floodwater ecology in a wetland ricefield. III. Dynamics of benthic molluscs 219
Singh G → Khanuja SPS
Sobotik M → Kandeler E
Speir TW → Bardgett RD
Speir TW → Yeates GW
Stephens PM, Davoren CW, Doube BM, Ryder MH: Ability of the earthworms *Aporrectodea rosea* and *Aporrectodea trapezoides* to increase plant growth and the foliar concentration of elements in wheat (*Triticum aestivum* cv. Spear) in a sandy loam soil 150
Stephens PM, Davoren CW, Ryder MH, Doube BM: Influence of the earthworm *Aporrectodea trapezoides* (Lumbricidae) on the colonization of alfalfa (*Medicago sativa* L.) roots by *Rhizobium meliloti* L5-30R and the survival of *R. meliloti* L5-30R in soil 63
Stephens PM → Doube BM
Suman A → Khanuja SPS

Tabatabai MA → Ajwa HA
Tenuta M → Bergstrom DW
Tietema A, Wessel WW: Microbial activity and leaching during initial oak leaf litter decomposition 49
Tisdall JM → Hindell RP
Toyota K, Kimura M: Earthworms disseminate a soil-borne plant pathogen, *Fusarium oxysporum* f. sp. *raphani* 32
Tsidall JM → Hindell RP

Vaughan D → Pant HK
Viswanathan R → Brunninger B

Watanabe K, Hayano K: Estimate of the source of soil protease in upland fields 341
Wessel WW → Tietema A
Wijlhuizen AG → Kester RA
Wright RJ → Siddaramappa R

Yeates GW, Orchard VA, Speir TW, Hunt JL, Hermans MCC: Impact of pasture contamination by copper, chromium, arsenic timber preservative on soil biological activity 200
Yeates GW → Bardgett RD

Zapata F → Kumaga F

Indexed in *Current Contents*